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PAPERS

OF THE

PEABODY MUSEUM OF AMERICAN ARCHAEOLOGY
AND ETHNOLOGY, HARVARD UNIVERSITY

VOL. XI. — No. 1

INDIAN BURIAL PLACE
AT WINTHROP, MASSACHUSETTS

BY

CHARLES C. WILLOUGHBY

WITH NOTES ON THE SKELETAL REMAINS BY

EARNEST A. HOOTON

FOUR PLATES AND TWENTY ILLUSTRATIONS IN THE TEXT

CAMBRIDGE, MASSACHUSETTS, U.S.A.

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NOTE

ACCOUNTS of a number of explorations carried on by the late Professor Frederick W. Putnam, or under his direction, remained unpublished at the time of his death. Two of the most important of these, dealing with the archaeology of Ohio, have since been brought out as parts of Volume VIII of this series, and it is hoped that others will follow.

The exploration of the small burial place at Winthrop, while merely an incident in Professor Putnam's work, is thought worthy of record owing to the early historic period to which the burials belong, and to the rarity of such discoveries in Massachusetts.

CHARLES C. WILLOUGHBY, *Director*

CAMBRIDGE, MASSACHUSETTS

April 18, 1924

INDIAN BURIAL PLACE AT WINTHROP MASSACHUSETTS

IN April, 1888, workmen, excavating for the narrow gauge railroad at Winthrop, Massachusetts, just across the harbor from Boston, unearthed three or four Indian skeletons. The skull of one of these lay in contact with pieces of thin copper, evidently parts of a copper vessel which had been placed over the head. The greater part of the skull was deeply stained by the metal which had preserved portions of the hair and scalp, and what appear to be parts of the brain and its membranes, also fragments of matting and other wrappings. As soon as Mr. C. A. Hammond, superintendent of the road, heard of the discovery, he secured the skulls and such other bones as had not been destroyed, and presented them to the Peabody Museum. On August 21, Mr. Hammond wrote to Professor Putnam as follows: "We are now obliged to make further excavations in the pound ¹ where relics have been found, and have already unearthed another skeleton, and more to follow, but I do not want to proceed further . . . until you can see the situation and give us some advice."

Professor Putnam was unable to go to Winthrop at the time, and arrangements were made for Mr. Hammond to discontinue the work on the road at that point for a few weeks. On November 22, the work of excavating the burials was begun under Professor Putnam's personal direction, and was continued for three days. Five graves were carefully opened. As these were the only ones within the line of the roadway which needed immediate attention, and as the weather meanwhile had become too cold to work to advantage, further investigations were postponed. On March 30, 1890, excavations were continued by Professor Putnam, and graves 8, 9, and 10 were opened. This burial place was located on the southern slope of a low sandy hill on the site now occupied by Centre Station of the Boston, Revere Beach, and Lynn Narrow Gauge Railroad. Its

¹ Built by act of the authorities of Boston dated February 23, 1634.

locality is shown on the accompanying sketch-map, plate 1, which indicates only the streets in the immediate vicinity of the station.

The positions of the skeletons are illustrated in figure 1. They were found at an average depth of about two feet, and artifacts were found in all of the graves opened by Professor Putnam, with the exception of number 3.

The pound in which the burials were discovered was built for the protection of cattle owned by the settlers of Boston. On the 23rd of February, 1634, the authorities voted that "there shall be a little house built and a sufficiently payled yard to lodge cattle in of

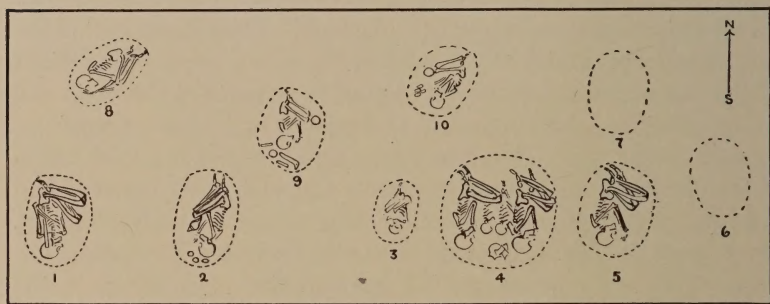


FIGURE 1

Burial Place at Winthrop: sketch-plan showing position of graves.

nights at Pullen Poynt Neck before the 14th day of ye next second month." ¹

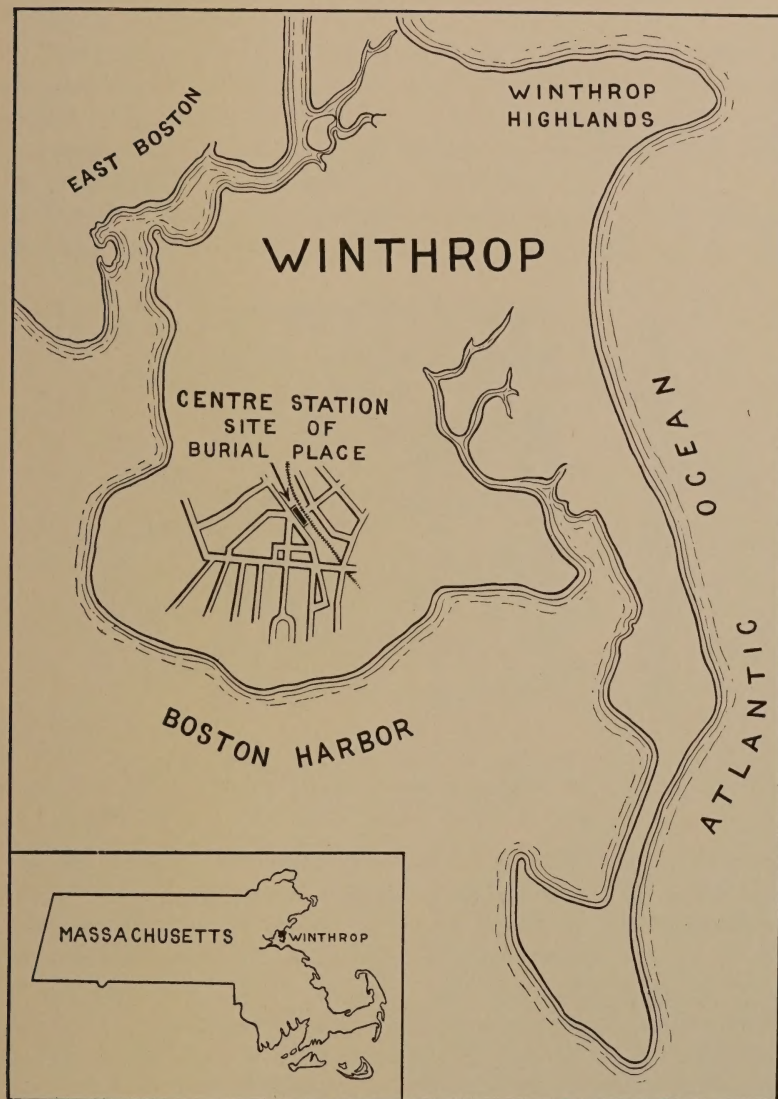
At the time of the discovery of the burials (1888), the place was traditionally known as "The Pound." In 1902, Mr. Charles W. Hall wrote as follows regarding it:

The house and palisaded yard thus erected were certainly the first built by the Massachusetts settlers within Winthrop territory. William Cheeseborough, Constable of Boston, and cattle guard at Pullen Point Neck, must have had his "corral" and house somewhere between the Court Park section and the Town Hall, as the natural water supply for the cattle was the swamp that formerly stood near the site of Winthrop Centre Station.²

From the above we may definitely assign to the burial place a date some time previous to 1634; and judging from the artifacts unearthed, it seems probable that the period is very near the begin-

¹ Charles W. Hall, *History of Winthrop*, 1902, p. 19.

² *Ibid.*



Map of Winthrop, Massachusetts, showing location of Burial Place. Only the streets in the vicinity of Centre Station are indicated.

ning of the seventeenth century. This locality was in the territory of the Massachuset Indians, and the burial place undoubtedly belongs to that tribe.

The rarity of Indian cemeteries of the proto-historic period in Massachusetts makes the interments here recorded of unusual interest. The majority of Indian skeletons which have been unearthed in this Commonwealth belong to a somewhat later date, and are usually unaccompanied by artifacts.

The first burials unearthed by the workmen are not located on the plan, as their exact positions were not recorded. As already

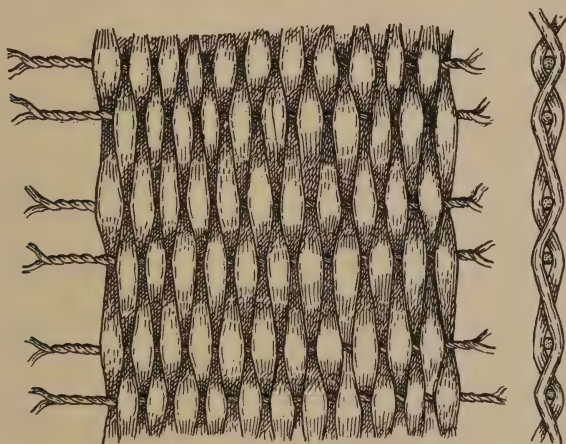


FIGURE 2

Section of bulrush mat showing weave. Found in contact with copper bowl covering skull of the first skeleton unearthed. (1/1.)

stated, the skull, which lay in contact with the copper vessel, and the adhering portions of the grave wrappings were sent to the Museum with the other bones. No pipes, beads, or other ornaments were noticed, such articles being easily overlooked.

This skull was that of an adult male, and, judging by the fragments of wrapping adhering to the copper, the burial was the result of careful preparation. The grave had apparently been lined or the body covered with birch-bark, and well-preserved pieces formed the outer portion of the adhering mass. The original pieces of bark had been sewed together with split roots. It is possible that this may have been a portion of a bark mat such as were used for portable

lodge coverings by the Algonquian tribes inhabiting the birch-bark area; but the sewing does not correspond to that occurring in examples of these bark mats in the Museum from the more eastern Algonquians. Within this outer covering of birch-bark was a layer of what appears to be the bark of the cedar, and within this, and in contact with the copper vessel covering the head of the skeleton, was a piece of woven bulrush mat which had been perfectly preserved by contact with the metal. The type of weaving shown in this mat is illustrated in figure 2. The warp cords are in pairs and are undoubtedly of twisted bast; the woof is of selected rushes. According to both Roger Williams and John Josselyn, the interiors of the more permanent Indian habitations of New England were lined with "embroidered mats or with mats of rushes painted in several colors." The mats of the Ojibwa of the Great Lakes area



FIGURE 3

Incisors of beaver, used as chisels, Grave 1. (1/1.)

are doubtless very similar to those of the Indians of this region. The color of the groundwork of the Ojibwa mats is the natural brownish-yellow of the dried rushes, and pleasing patterns are produced in considerable variety by weaving in rushes dyed in various colors. Both Williams and Josselyn undoubtedly refer to mats which were woven in colors, not embroidered or painted. This specimen is of special interest, as it is probably the only example extant from New England. Mats from Algonquian tribes in general are usually about 3 feet wide by 5 to 7 feet long, with cross-stripes, lozenge-shaped figures, or other designs, usually in red, yellow, and black. Although coarser, they resemble some of the well-known commercial floor-mattings from China and Japan.

The metal object which lay in contact with the skull appears to



Burial Place at Winthrop: Grave 1, showing skeleton of a man with iron implement and bone arrowpoints.

have been a basin about 12 inches in diameter and 3 inches deep, made from sheet-copper. It had become corroded in places and was broken into numerous pieces. The largest fragment is about 7 by 4 inches. Many of the smaller pieces were apparently overlooked by the workmen. The edge of the basin was not turned over or wired, but was roughly cut and made smooth, probably by grinding. This may possibly have been made by an Indian workman by cutting a disc of the proper size from a sheet of copper and beating it into concavo-convex form. Similar large drinking cups of this metal were seen by Brereton in possession of the Indians of southern Massachusetts in 1602.

Grave 1. This was opened by Professor Putnam. It was 30 inches deep, and contained the skeleton of a man in a flexed position. Ly-



FIGURE 4
Bone arrowpoints, Grave 1. (1/2.)

ing parallel to the spinal column, in the position shown in plate 2, was a much corroded implement or bar of iron, $23\frac{1}{2}$ inches long, $\frac{7}{8}$ of an inch wide, and $\frac{1}{4}$ of an inch thick, one end of which tapered to a chisel-like edge.

Over this implement were five bone points and an incisor of a beaver such as were commonly hafted and used as chisels or knives (figure 3). On the opposite side of the body was another group of five bone points and a second beaver tooth. Both groups of points are illustrated in figure 4. The position of the first group is shown in the photograph. It seems probable that these points were all that remained of two groups of arrows. It will be noticed that in the first group the points lay nearly parallel with each other, with the

tips in one direction, as would be the case had they been attached to shafts. The relative positions of the individual points in the second group are not recorded. It is interesting to note in this connection that the Virginia Indians used a beaver tooth, properly hafted, for notching the feathered end of their arrow shafts.¹

Many varieties of arrowpoints were used by the New England Indians, including flint, bone, the hollowed tips of deer antler, eagle claws, tails of the horseshoe-crab, and triangular points of sheet-brass. At the time of the arrival of the colonists, sheet-brass points



FIGURE 5

One of the lumbar vertebrae of skeleton from Grave 1, showing brass arrowpoint which had been shot through the abdomen of the Indian. (2/3.)

had almost wholly replaced those of flint. The arrows were carefully made. Elder twigs were a favorite wood for the shaft, into one end of which was inserted a foreshaft of heavier wood, to which the point was attached.

Higgeson, writing in 1629 of the arrows of this region, says that some were headed with bone, some with brass.² These two varieties of arrowpoints were found in the grave we are describing. The one of brass had caused the death of this Indian. It was found half buried in the forward portion of one of the lumbar vertebrae, and is

¹ Captain John Smith, *Voyages and Discoveries*, Arber Edition, vol. 1, pp. 364, 365.

² *New England's Plantations*, Massachusetts Historical Collections, 1st Series, vol. 1, p. 123.

shown in position in figure 5. The arrow had been shot into the abdomen as the Indian was facing his opponent.

The only other artifacts recovered were a bead-like object of sheet-copper, one end somewhat larger than the other, and a bone point or awl, which was apparently in the earth used for filling the grave.

Grave 2. This was dug to the depth of $2\frac{1}{2}$ feet and had been lined with matting. It contained the flexed skeleton of a woman. At its left side lay an unworked shell of *Fulgur canaliculata*, a species not

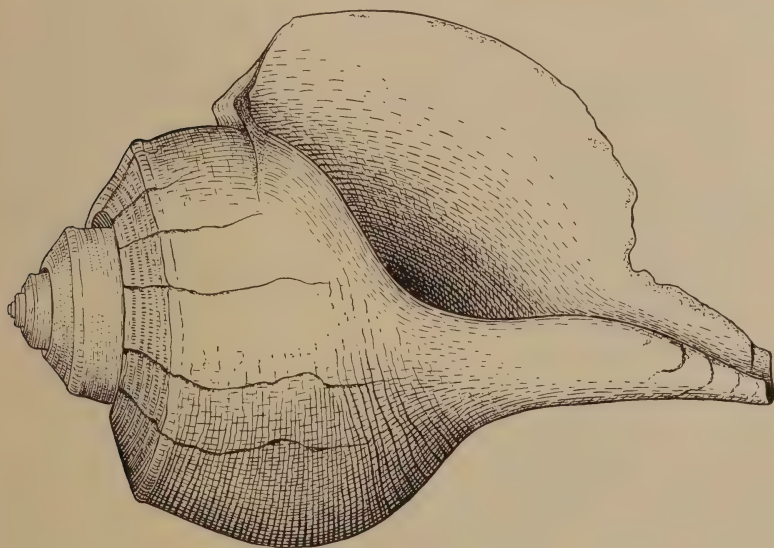


FIGURE 6

Shell of *Fulgur canaliculata* probably used as a drinking cup, Grave 2. (2/3.)

uncommon on the Massachusetts coast. This was probably used as a drinking cup or dipper (figure 6). About a foot from the skull were the three pottery vessels which are illustrated in figures 7 and 8. Near the left shoulder were also about twenty beads, approximately 4 inches in length and $\frac{1}{4}$ inch in diameter, examples of which are illustrated in figure 9, and also what appears to be a piece of a skin garment in which the body was wrapped. Each bead was made of a section of a twig, probably elder, with the pith removed, and neatly covered with thin sheet-copper, the salts of which had preserved the two-ply twisted cord with which the beads had been

fastened together. These beads had not been strung end to end as a necklace, but seem to have been fastened side by side into a sort of band, similar to that taken from the Indian skeleton found near Fall River in 1831, and later made famous by Longfellow as the skeleton in armor. Beads similar to these, made of sheet-copper or brass, were quite common among the New England Indians at a very early date, and many have been taken from graves. Sheets of

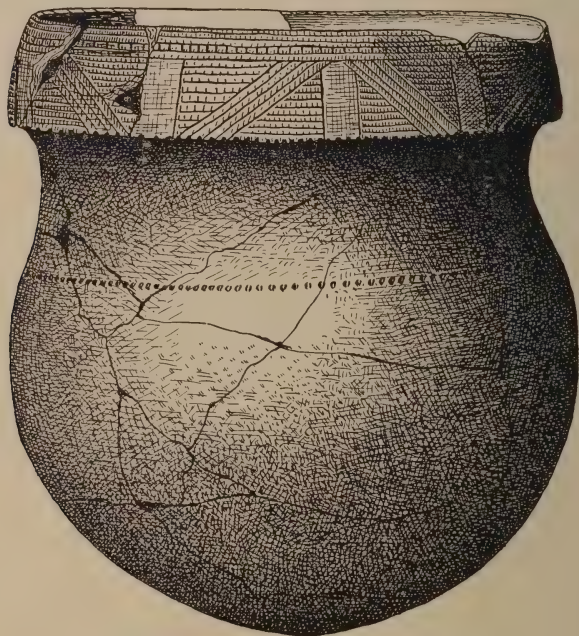


FIGURE 7
Pottery vessel, Grave 2. (1/2.)

copper and brass were undoubtedly sold to the Indians of this region by European fishermen and explorers many years before the arrival of the colonists. As early as 1524, Verrazano saw many plates of wrought copper in possession of the Indians of southern New England. These were undoubtedly of European origin. Brereton in 1602 saw among the Indians of Massachusetts:

. . . a great store of Copper, some very red, and some of a paler colour [brass]; none of them but have Chaines, Eare-rings, or Collars of this metall;

they head some of their Arrows herewith much like our broad Arrow heads, very workmanly made. Their Chaines are many hollow pieces semented together, each piece of the bignesse of one of our reeds, a finger in length, ten or twelve of them together on a string, which they weare about their neckes: their Collars they weare about their bodies like Bandolieres a handfull broad, all hollow pieces, like the other, but somewhat shorter, foure hundred pieces in a Collar, very fine and evenly set together. Besides these they have large drinking cups made like Sculls [bowls], and other thinne plates of Copper, made much like our Boare-spear blades, all of which they so little esteeme as they offered



FIGURE 8
Pottery vessels, Grave 2. (1/2.)

their fairest Collars and Chaines for a Knife, or such like trifle, but we seemed little to regard it.¹

The twisted cord on which the copper beads found with this skeleton were strung is larger and coarser than is commonly used for this purpose, and the material from which it is made has the appearance of sinew.

The three pottery vessels belong to the later Algonquian group. The clay from which they are made is of good quality and is tempered with crushed burnt shell. Cooking vessels having nearly globular bodies like these were usually suspended over the fire. The older pots with pointed bottoms belonging to the archaic group of primitive New England pottery, sherds of which are common in the older shell-heaps, were supported by hearth-stones or were set a few inches into the ground, instead of being suspended. The decoration upon these three vessels is characteristic

¹ Brereton, *Account of Gosnold's Voyage*, Mass. Hist. Coll., 3d Series, vol. VIII, p. 91.

of the pottery of this region, and consists of incised lines or depressed markings, probably made with pointed or notched sticks or similar tools. On the body of the largest vessel, and also on the one illustrated in figure 10, are faint impressions of cord-wrapped paddles such as were used in pottery making over an extensive area east of the Mississippi River.

The round-bottomed pottery of the later New England Algonquians has many characteristics of Iroquoian ware. The Iroquois were excellent potters, and while the clay vessels of the two peoples are as a rule easily distinguished, the influence of the work of these

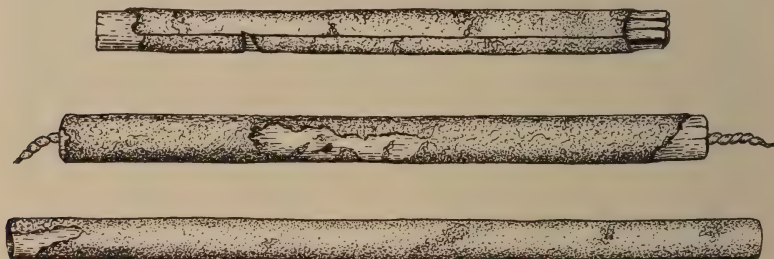


FIGURE 9

Tubular beads of elder wood covered with thin sheet-copper, Grave 2. (1/1.)

New York tribes was marked on the fictile art of the natives of the southern portion of New England.

The so-called "Red Paint" people, the oldest New England Indians of whom we have knowledge, made no pottery. The earliest New England potters were undoubtedly the Algonquian tribes whose refuse is found on many of the older village sites inland, and especially in the ancient kitchen-middens or shell-heaps of our tide-water region. The broken pottery from these sources shows that the bottoms of the pots were more or less pointed. These vessels could not stand upright without being supported by a tripod of stones, or by being set with the pointed bottom an inch or two in the earth. This older type of pottery extended southward along our coast to Virginia, where it was used as late as the latter part of the sixteenth century. Hariot describes its use as follows:

After they set them upon a heape of earth to stay them from fallinge, they putt wood under which being kyndled one of them taketh great care that the fyre burn equallye rounde abowt.

The more or less globular bodies of the pots from these graves, however, taken in connection with their restricted necks, seem to indicate that they were intended principally for suspension by means of a band encircling the vessel below the rim, to which cords or thongs were fastened.

The rounded bottoms suspended a few inches from the live coals would expose a large surface to the direct heat, without obstructing the draft or deadening the fire. In "Mourt's Relation" we have a description of an Indian wigwam at Cape Cod in 1620. In the midst of this mat-covered house was the fireplace, where were found "four little trunches [crotched sticks] knockt into the ground and small sticks laid over on which they hang their pots and what they had to seeth."¹

The few other references to the earthenware of the Indians of eastern Massachusetts are as follows. Gookin in 1674 writes:

The pots they seeth their food in, which were heretofore and yet are in use among some of them are made of clay or earth, almost in the form of an egg with the top taken off. But now they generally get kettles of brass, copper or iron. These they found most lasting than those of clay, which were subject to be broken, and the clay or earth they were made of was very scarce and dear.²

Morton tells us:

They have earthen potts of divers sizes, from quart to a gallon, 2 or 3, to boyl their vitels in, very strong though they be thin like our iron pots.³

Champlain found pottery in use along the Massachusetts coast, and says that "when the natives eat Indian corn they boil it in earthern pots which they make in a different way from ours."⁴

Of the many New England potsherds examined by the writer, only one or two show indications that the vessel of which they formed a part may have been made by the coiling process.

It seems doubtful if this method, so common in the West, was used to any great extent by the northeastern tribes. The following, as quoted by Laverdière, from Sagard's "History of Canada," written in 1636, doubtless refers to Iroquoian potters; the description may apply as well to the Algonquian potters of New England:

¹ *Journal of the Pilgrims at Plymouth* (London, 1622), Cheever's Reprint, p. 39.

² Gookin, *Mass. Hist. Coll.*, 1st Series, vol. i, p. 151.

³ Thomas Morton, *New English Canaan* (1637), Prince Society Reprint, p. 159.

⁴ *Champlain's Voyages*, Prince Society Reprint, vol. II, p. 86.

They are skilful in making good earthen pots which they harden very well on the hearth, and which are so strong that they do not, like our own, break over the fire when having no water in them. But they cannot sustain dampness nor cold water so long as our own, since they become brittle and break at the least shock given them; otherwise they last very well. The savages make them by taking some earth of the right kind, which they clean and knead well in their hands, mixing with it, on what principle I know not, a small quantity of grease. Then making the mass into the shape of a ball, they make an indentation in the middle of it with the fist, which they make continually larger by striking re-

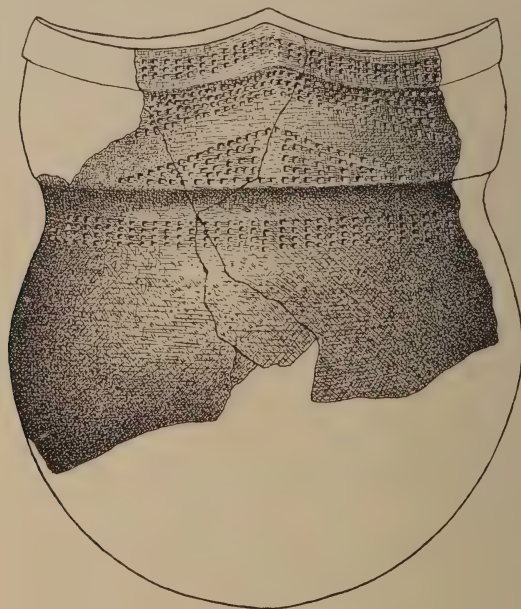


FIGURE 10
Pottery vessel, Grave 4. (1/2.)

peatedly on the outside with a little wooden paddle as much as is necessary to complete it. These vessels are of different sizes, without feet or handles, completely round like a ball, excepting the mouth, which projects a little.¹

Grave 3. Skeleton of a child about one year old, at a depth of 2 feet. No artifacts were found with it.

Grave 4. A shallow grave containing the skeletons of a man, a woman, and two children, in the positions shown in plate 3. Fragments of the pottery vessel, illustrated in figure 10, lay near the

¹ *Champlain's Voyages*, Prince Society Reprint, vol. II, p. 86, note.



Burial Place at Winthrop: Grave 4, showing skeletons of a man, woman, and two children, and a broken pottery vessel.

head of the woman. Beneath her head were 80 blue and white tubular glass beads, $\frac{3}{8}$ to $\frac{5}{8}$ of an inch long and of various diameters, also a few copper beads of about the same size. There were also found in this grave 148 white beads made from the columella of one of the larger univalves, probably *Fulgur carica* or *Fulgur canaliculata*, and a few small discoidal beads of mussel shell (plate 4). The white beads are of ancient type and were made before the common white and purple wampum became the vogue among the Indians of New England and the Middle States. This later commercial wampum, made principally from the shell of the quahog, was introduced into New England by the Dutch about 1628.

Grave 5. A much decayed skeleton of a man lay 2 feet below the surface. The earth at this point was less sandy than the other

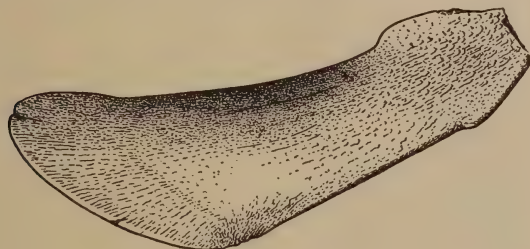


FIGURE 11

Spoon made of antler, Grave 9. (1/2.)

sections of the cemetery, and the dampness caused a more rapid disintegration of the bones. The only artifacts found were a few tubular white shell beads and five tubular glass beads which lay beneath the jaw.

Graves 6 and 7. Unearthed by workmen. Exact locality unrecorded. No artifacts found with skeletons.

Grave 8. Skeleton of man, 2 feet below the surface, in the usual flexed position, and facing southeast. The only implement recovered was a bone awl lying about 4 inches back from the vertebral column.

Grave 9. This contained the skeleton of a child, two to three years old, at a depth of 14 inches, and judging by the objects found, it must have been a girl. Near the head were fragments of a pottery vessel of about the size and shape of the one illustrated in figure 7; also the antler spoon shown in figure 11. Nearby lay the

stone pestle (figure 12) with its upper portion carved to represent the head of an animal, also the small water-worn stone (figure 13)

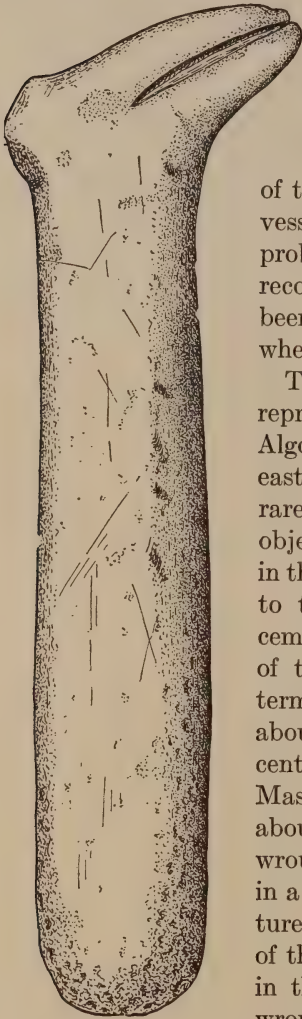


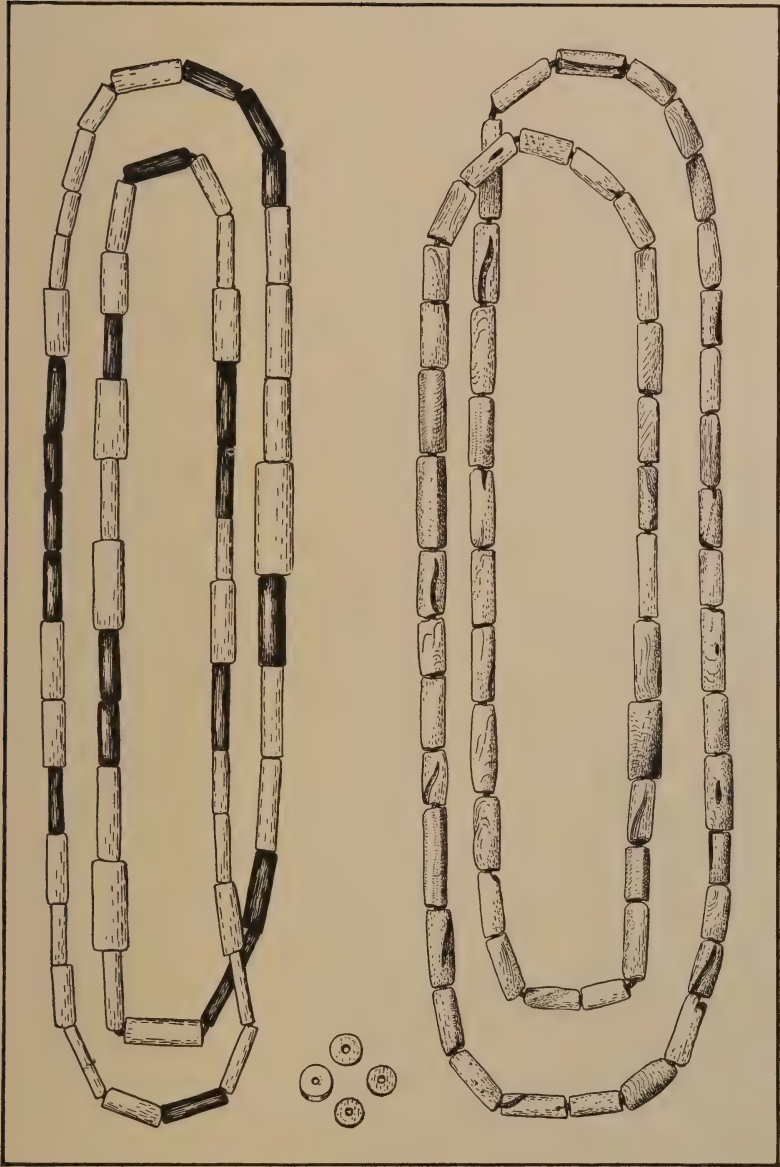
FIGURE 12
Stone pestle, Grave 9.
(1/2.)

which resembles the ordinary polishing or sharpening stone although it shows no sign of use. As one end of the stone somewhat resembles an animal head, it seems not unlikely that this may have been a toy. Near the knees

of the skeleton was found the small pottery vessel illustrated in figure 14. This also was probably a toy. The only other artifact recovered was a bone point, which may have been thrown into the grave with the earth when covering the body.

The pestle is of considerable interest as it represents a type not uncommon among the Algonquian tribes of New England and the eastern sections of the Middle States, but rare in the adjacent regions. Although no object of European provenience was found in this grave, the burial undoubtedly belongs to the same period as the others in this cemetery, which would indicate that pestles of this general form, with or without the terminating animal head, were used up to about the beginning of the seventeenth century. Judging from the collections from Massachusetts in the Peabody Museum, about five per cent of the more carefully wrought stone pestles terminate at one end in a knob or a more or less carefully sculptured head of an animal. The best example of this type known to the writer was found in the Kennebec Valley, and has a finely wrought human head at the upper extremity. These pestles are of various lengths, up to about 28 inches, and are commonly about 2

to $2\frac{1}{2}$ inches in diameter. They are usually made of a variety of metamorphosed slate, and are generally gray or greenish in color.



Burial Place at Winthrop: Blue and white tubular glass beads (at left); tubular beads of shell, and small discoidal beads of mussel shell, all from Grave 4. (1/1.)

They were probably used with wooden mortars made by burning a hole in the end or the side of a section of a tree trunk. There is an old Indian mortar and pestle from Nantucket in the Peabody Museum. The mortar is made from a section of an oak tree trunk. It is about 20 inches high, 9 inches in diameter, and has a cavity about 10 inches deep. This is probably similar to the larger mortars used in prehistoric times in New England. With such mortars the longer



FIGURE 13

Water-worn stone remotely resembling a small animal, Grave 9. (1/2.)

stone pestles were probably used. It is also probable that long wooden pestles similar to those still common among the Algonquians of the Great Lakes region were used in these mortars. The pestle that accompanies the old mortar above mentioned is about 30 inches long, and is of wood with the exception of the lower portion, which consists of a short piece of an ancient stone pestle fitted to the wooden handle and bound with an iron band. The smaller stone pestles were probably used in wooden mortars of relative size, and were doubtless for preparing maize foods, "medicine," and other substances.

Schoolcraft figures, on plate 21 of the fourth volume of his work, a woman grinding corn. There is an ancient stone pestle, with a head at its upper end, suspended by a cord from the limb of a tree which serves as a spring-pole. A very broad and shallow mortar of stone is shown below. In connection with this picture are two views of the stone pestle drawn to a much larger scale. On page 175, under the caption "Relics from New Hampshire," is the following reference to this illustration:



FIGURE 14

Toy pottery vessel,
Grave 9. (1/2.)

The mode of pounding maize by suspending a stone pestle from the limb of a tree as practised by the ancient Pennacooks of the Merrimack Valley in New Hampshire is represented in plate 21. The pestle is commonly ornamented by

the head of a man or quadruped, neatly carved from greywacke, or compact sandstone, the mortar being also of the same material.

This reference has been widely quoted. It seems apparent, however, that Schoolcraft was describing a stone pestle found in the habitat of the Pennacook Indians in the Merrimack Valley which he figures separately, and that his accompanying drawing showing a woman using this same pestle is wholly ideal. Stone mortars of Indian origin, such as is shown in this drawing, if they occur at all in New England, are extremely rare.

Referring previously to the use of the spring-pole in connection with the mortar and pestle, Schoolcraft says (vol. III, page 467):

After the introduction of the iron axe consequent on the discovery, stumps of trees were excavated to serve the purpose of a mortar, a practice which com-



FIGURE 15

Spoons: the larger is made of sheet-brass, the smaller of sheet-copper,
Grave 10. (1/2.)

mended itself to the early back settlers who improved on the idea by attaching the wooden pestle to a spring-pole loaded in such a manner as to lift the pestle from the block with but little effort.

It seems doubtful, therefore, if the spring-pole was used by the New England Indians in ancient times.

Grave 10. Skeleton of a child two to three years of age, probably a boy. Near the foot of the grave were fragments of a pottery vessel. Near the extremity of the forearm lay a deposit consisting of two spoons, the larger made of sheet-brass and the smaller of sheet-copper (figure 15); 5 pendants and a disc having two perforations, all of sheet-brass (figure 16); a terra-cotta pipe (figure 18); the remnants of a bag of coiled netting which had evidently contained the pipe; and what may have been the remains of a second bag, probably of dressed skin, which perhaps had held the metal spoons. With these objects were several seeds, resembling those of a variety of the *Cornus*, having the ends ground down to the cavity, thus

forming a perforation for the purpose of stringing for use as beads. With the skeleton were also several glass beads, both blue and white, of the same kind as those shown in plate 4; and the iron adze blade illustrated in figure 17.

Roger Williams says that "generally all the [Indian] men throughout the country have a tobacco bag with a pipe in it hanging at their back." It was doubtless such a bag which was placed in this grave. It was of coiled netting (figure 19), a style of fabric used principally for bags by various tribes of both North and South America, and also found among the natives of Africa and the Pacific Islands. The foundation for the mouth of these bags was a cord over which the first coil of the bag was looped, as indicated in the drawing. This looped coiling was continued spirally downward, the

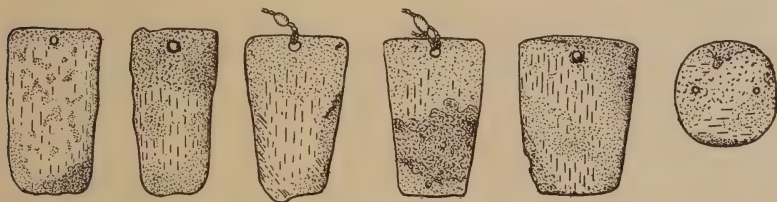


FIGURE 16

Pendants and disc of sheet-brass, Grave 10. (1/2.)

lower portions of the bag being drawn in gradually until the center of the bottom was reached. The texture is shown more open in the illustration than in the original, for the purpose of making the technic clearer. This is the first record of the occurrence of this fabric among the natives of New England.

So little remains of what appears to be a second bag that it is impossible to tell the material of which it was made. It was probably of dressed skin, however, and was apparently ornamented with the brass pendants and disc (figure 16); beads made from seeds; and a double fringe of hair, a section of one layer of which is shown in figure 20.

The tobacco pipe is of a type evidently fairly common at the beginning of the seventeenth century, and probably also at a much earlier date. It is of terra-cotta, and of a form occurring among the eastern Algonquians from Virginia northward, to and including the southeastern portion of New England. This specimen has its stem

covered with a piece of sheet-brass, very neatly joined. The majority of these pipes, however, are without this metal reinforcement. Gosnold in 1602 saw among the Indians in the vicinity of Buzzards Bay, southern Massachusetts, pipes "steeled with copper." Brereton's account is more explicit. He says:

the necks of their pipes are made of clay, hard dried . . . the other part is a piece of hollow copper very finely closed and cemented together.¹

This is a very good description of the pipe from this burial. There are two other terra-cotta pipes in the Museum from Massachusetts Indian graves in the vicinity of Boston, having bowls also bound with sheet-brass. It is probable that the stems of both were originally covered with the same material, for one still retains a narrow band of brass just below the bowl, and the lower portion of the other had evidently been cut down to fit a tapering metal stem.



FIGURE 17
Adze blade of iron,
Grave 10. (1/2.)

During this period, stone tobacco pipes with figures of men or beasts in relief upon them were also in use

by our Indians. This is shown by the accounts of contemporary writers, and by archæological investigations. The platform pipe, however, frequently found in this region seems to belong to an earlier period.

The two spoons found near the bag containing the pipe were neatly made, the larger of sheet-brass and the smaller of sheet-copper. The concavo-convex form of the bowls may have been produced by hammering that portion of the unfinished spoon into a corresponding depression in a block of wood with a round-faced hammer of some kind, a method followed by our sheet-metal workers in making various objects, up to quite recent times. The edges of the spoons are ground smooth. If they were originally cut with heavy shears, or if they were finished with a file, all traces seem to have been removed by grinding. The edges of the brass pendants appear to have been finished in the same manner, but the perforations in the pendants were doubtless produced with an iron punch, as the bur upon the under side is very marked. The copper basin found with the first burial described was doubtless shaped by the

¹ Brereton, *op. cit.* p. 88.

same process as were the bowls of the spoons. The metal handles of the spoons are very short, and it seems reasonable to suppose that they were originally attached to longer handles of wood. On the whole, it seems probable that the basin and spoons were made by Whites who possessed only crude tools, although it is possible that they were worked out of sheet metal by the Indians.

The occasional finding of tobacco pipes in graves of young children is an interesting indication of the affectionate forethought of the parents for the future comfort and welfare of the departed boy. It seems to indicate a belief in the continued growth and maturity



FIGURE 18

Terra-cotta tobacco pipe with stem covered with sheet-brass and wound with sinew, Grave 10. (2/3.)

of the spirit, for it is hardly probable that these very young children were users of tobacco at the time of their death.

Throughout the century following the discovery of Newfoundland by Cabot in 1497, ships from various nations of Europe visited the northeastern coast of America, and had more or less communication with the natives. Verrazano, the Florentine explorer, reached the eastern coast of America in 1524, and turning northward explored the bays and inlets to about the latitude of eastern Maine. He gives an accurate account of the Indians of southern New England, and describes their habitations, dress, canoes, agriculture, etc. He writes as follows of the copper found among them:

We saw many plates of wrought copper which they esteem more than gold, which for the color, they make no account of, for that among all other is accounted the basest. They make most account of azure and red. The things they esteemed most of all those which we gave them were bells, crystals of azure color, and other toys to hang at their ears and about their necks.¹

This copper must have been obtained from previous explorers of whom we have no account; for although an occasional implement

¹ *Relation of John Verrazano*, Hakluyt's *Divers Voyages*, Hakluyt Society Reprint, p. 65.

and a few small beads have been found, wrought from native copper, nothing in the way of metal plates or large beads has been recovered in New England which was not made of European copper or brass. It has been suggested that much of the sheet metal was obtained from wrecked ships. It seems much more probable that it was acquired in trade with the early fishermen and explorers, many of whom undoubtedly skirted our New England shores in the sixteenth century. In 1535, Cartier sailed up the St. Lawrence. It ap-

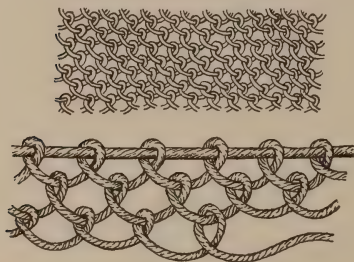


FIGURE 19

Section of bag of coiled netting, the lower enlarged drawing shows the technic more clearly, Grave 10. (1/1.)



FIGURE 20

Section of layer of fringe, probably a part of bag, Grave 10. (1/1.)

pears that the English trade "out of England to Newfoundland was common and frequented" as early as 1548.¹

In 1578, Anthonie Parkhurst wrote a letter to Richard Hakluyt, a portion of which is as follows:

Now to answer some part of your letter touching the sundry navies that come to Newfoundland or Terra nova, for fish: you shal understand that some fish not neere the other by 200. leagues, and therefore the certaintie is not knowen; and some yeres come many more than other some, as I see the like among us: who since my first travell being but 4. yeeres, are increased from 30. sayle to 50. which commeth to passe chiefly by the imagination of the Westerner men, who thinke their neighbours have had greater gaines then in very deed they have, for that they see me to take such paines yeerely to go in proper person: they also suppose that I find some secret commoditie by reason that I doe search the harbors, creekes and havens, and also the land much more than ever any Englishman hath done. Surely I am glad that it so increaseth, whereof soever it springeth. But to let this passe, you shall understand that I am informed that they are above 100. saile of Spaniards that come to take Cod besides 20. or 30. more that come from Biskaie to kill Whale for Traine. These be better appoynted for shipping and furniture of munition, then any nation sav-

¹ *Hakluyt's Voyages* (Glasgow Edition, 1904), vol. viii, p. 9.

ing the Englishmen, who commonly are lords of the harbors where they fish, and do use all strangers helpe in fishing if need require, according to an old custome of the countrey, which they do willingly, so that you take nothing from them more then a boat or twaine of salt, in respect of your protection of them against rovers or other violent intruders, who do often put them from good harbor, &c. As touching their tunnage, I thinke it may be neere five or sixe thousand tunne. But of Portugals there are not lightly above 50. saile, whose tunnage may amount to three thousand tuns, and not upwarde. Of the French nation and Britons, are about one hundred and fiftie sailes, the most of their shipping is very small, not past fortie tunnes, among which some are great and reasonably well appointed, better then the Portugals, and not so well as the Spaniards, and the burden of them may be some 7000. tunne. Their shipping is from all parts of France and Britaine, and the Spaniards from most parts of Spaine, the Portugals from Aviero and Viana, and from 2. or 3. ports more. The trade that our nation hath to Island maketh, that the English are not there in such numbers as other nations.¹

From the above we learn that at this date there were evidently nearly 400 European vessels engaged in taking fish or whales, and probably a portion of them incidentally trading for furs, in an area 600 miles in diameter in the vicinity of Newfoundland and Cape Breton. The New England coast was doubtless within this 600 mile area, and there seems to be no reasonable doubt that it was visited by many of these ships and that there was more or less intercourse between these vessels and the natives. This seems to be the most reasonable explanation of the origin of the quantities of copper and brass objects recorded by early writers as in possession of the Indians of this region, and it doubtless explains their presence in early proto-historic graves of the tidewater region. It may also explain the presence of certain unusual forms of porcelain and glass beads.

In September, 1907, the attention of the writer was called to the finding of an Indian cemetery on the slope of a hill in Ipswich, Massachusetts, where the land was being graded. One or two graves were uncovered, and with the burials were found a terra-cotta pipe similar to the one illustrated in figure 18, but without the brass binding on the stem; a bracelet of small beads of sheet-copper strung alternately with blue glass beads; a necklace of small white porcelain beads of oval form; and the bronze brazier shown in figure 21. Only a few fragments of bone were recovered.

Obtaining permission, in behalf of the Museum, of the owner of

¹ *Hakluyt's Voyages* (Glasgow Edition, 1904), vol. viii, pp. 9-11.

the estate, Mr. F. B. Harrington, investigations were carried on at the burial place for several days. A few additional graves were opened, but no artifacts were found. In each of these graves the skeletons had disintegrated, leaving nothing but a whitish paste in the damp soil in place of the bones. This, upon drying, turned to powder. Not a tooth was recovered. The bodies had been interred in a soil composed largely of clay, which allowed the water to



FIGURE 21

Bronze brazier from an Indian grave at Indian Hill, Ipswich, Massachusetts. (1/3.)

percolate but slowly; consequently the disintegration of the bones was probably more rapid than it would have been had they been buried in sand or gravel.

Not being able to determine the provenience of the brazier from collections in our colonial museums, inquiries were made at the British Museum, at the Museum at Hull, England, and at the Museo de Anthropologia, Madrid. No reply has come from Madrid. From the first institution, the following was received:

We have two or three bronze (not brass) braziers with a general similarity to the one of which you enclose a photograph. One has projections rising from the rim in a similar manner, presumably to support a vessel placed above, but they have no curves and are not so "spiky." We have no precise data to help us in dating, but regard our specimens as late 15th or early 16th Century.

From the Hull Museum we received the following:

In reply to your letter of the 5th instant, the object shown on the photograph seems to be a brazier, is probably late 16th Century in date, and appears to be of Spanish origin.

If the last identification is correct, the specimen must have been obtained from a Spanish or Portuguese ship which communicated with the Massachuset Indians during the latter half of the sixteenth century.

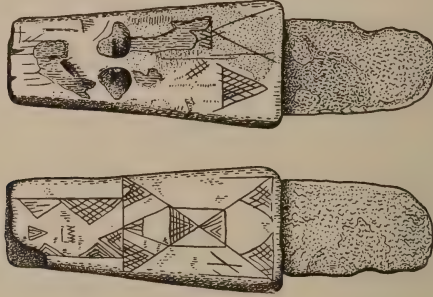
No exhaustive study has been made of the various types of glass and porcelain beads which have been recovered from Indian graves of eastern New England. When this is done it may throw additional light on the intercourse of the natives with the sixteenth century fishermen and traders.

Previous to the arrival of the colonists, the most valued articles obtained from the Whites were probably glass beads, and sheet-copper and brass. There seems to be no evidence that European cloth was sold to the Indians during this period. After the colonists became established, many well-made brass and copper kettles of various sizes and forms were obtained by barter, in addition to sheets of these metals, which were still in demand. The Indians also were able to procure European cloth, cast brass spoons, glassware, crockery, etc., and an occasional object of pewter, all of which have been found in graves dating about 1625 to 1670.

During the latter part of the seventeenth century, however, a considerable change took place in the burial customs of this section, especially among the so-called Christianized Indians, and most of such graves which have been opened contain no artifacts and the skeletons are usually in a horizontal position.

The long cultivation of the fields of this Commonwealth, the grading of lands, and the many excavations preliminary to building houses and roads, have brought to light relatively few Indian graves as compared with many sections of this country. These graves have usually been found singly or in small groups, and many

were without artifacts. Their discovery has usually been under conditions which did not allow careful investigation by experienced excavators, therefore it is hoped that the foregoing account will prove of special value to those interested in the archæology of our northern Atlantic seaboard.



Knife with antler handle, and blade probably made from a piece of brass kettle. Found with an Indian skeleton on Hermon Street, Winthrop, in 1886. The handle is of a type originally used for flint blades. (1/2.)

NOTES ON THE SKELETAL REMAINS

BY EARNEST A. HOOTON

These remains from the Winthrop cemetery consist of incomplete skeletons of seven adult males, four adult or sub-adult females, and five infants. Two of the skeletons of males are well preserved, as is also the skeleton of one female. But none of them is complete. Several skeletons are represented only by calvariae or skull fragments.

In connection with the cranial measurements and indices, the most important morphological features of the various crania are described. Following this, a brief consideration of the salient characters of the long bones accompanies the table recording their measurements and indices.

60380, Grave 1. This is the skeleton of a young adult male. The brain case is of good size and very dolichocephalic (71.4). It is also hypsicephalic (75.0) and akrocephalic (105.1). The frontal region is of medium breadth, but low and retreating; the sagittal region has a very pronounced median elevation; the temporal regions are flat, with moderate supramastoid crests, and the occipital region is moderately convex, and has a slight torus.

The serration of the sutures is simple, and obliteration has begun externally only in the obelion region of the sagittal suture. There are a few small Wormian bones in the lambdoid suture, and one in each of the squamous sutures. There is also a very small bone in the right side of the coronal. The pterions are of the usual medium H-form, and there are no parietal foramina. One small right retromastoid foramen, and one small and one medium left foramen were observed. The mastoids are of medium size.

The brow-ridges are large and divided into median and lateral portions. There is a moderate depression at nasion. The nasal bridge is narrow, of medium height, and concavo-convex in profile. The moderately broad nasal aperture shows lower borders of fair development and a large nasal spine. The orbits are low and broad, with a medium inclination of their horizontal axes. There

are no infraorbital sutures, and the suborbital fossae are shallow. Malars and zygomata are very large. Only a slight alveolar prognathism is apparent.

The dentition is complete, but seven of the molars have been lost in life. The crowns of the teeth are much worn, and the quality is a little below the average for Indians. The palate is elliptical in shape and has a medium torus. The glenoid fossae are deep, with well-developed postglenoid processes. The styloids are very large. The middle lacerate foramina are of medium size, and the depression of the petrous parts of the temporal bone is about average, as in typical Europeans. A complete pterygo-spinous foramen occurs on the right side, and indications of one are found on the left side. There are no dehiscences in the floor of the auditory meatus. The muscular impressions on the skull are well marked.

The mandible is large, with a well-developed chin eminence, stout ascending rami, and everted gonial angles. The mylo-hyoid ridge and genial tubercles are well developed.

This is a typical Eastern Indian dolichocephal. The facial index is mesoprosopic, and the gnathic index shows no prognathism. The orbits are chamaeconch, the nose is leptorrhine, the palatal index is brachyuranic, and the capacity (1480 cc.) is above average for Indians.

60388, Grave 8. This is the skeleton of a middle-aged adult male. The frontal region is low and retreating, but broad. The sagittal region has a slight elevation and the breadth is narrow. A slight postcoronoid depression is noticeable. The temporal region is flat, with a small supramastoid ridge. The occipital region is of medium convexity, with traces of a torus. The serration of the sutures is simple. Obliteration is far advanced in the sagittal suture, the external thirds of the coronal suture are closed, and obliteration is beginning in the lambdoid. There is one medium Wormian bone in the lambdoid suture. The pterions are of a medium H-form. There is one small parietal foramen on the right side and one medium on the left. On the left side there are one medium and two small retromastoid foramina, and on the right side one medium and three small. The mastoids are large. The brow-ridges are prominent and divided into medium and lateral portions. There is a small depression at nasion, and the nasal bridge is of medium height and breadth. In profile it is concavo-convex.

The nasal aperture is broad, with a moderate development of the lower borders and the nasal spine. The orbits are low and oblong in shape, with the horizontal axes slightly inclined. There are no infraorbital sutures, and the suborbital fossae are shallow. The malars and zygomata are large, but alveolar prognathism is slight.

The dentition is complete, and the teeth are moderately worn and of fair quality. Several abscesses, caries, and traces of pyorrhoea are evident. The number of cusps of the molar teeth cannot be counted, nor is it possible to ascertain the presence or absence of shovel incisors. The palate is parabolic in shape, with a moderate torus. The glenoid fossae are of medium depth and show a medium postglenoid process. The styloids are small. The middle lacerate foramina are large, and the depression of the petrous portions of the temporal bones is about the average for Europeans. The posterior lacerate and postcondyloid foramina are ordinary. The foramen magnum is hexagonal. Partially formed pterygo-spinous foramina are present.

The mandible is large, with a well-developed mental process. The mylo-hyoid ridge is submedium in development, but the genial tubercles are average. Slight traces of a mandibular torus may be noticed.

60379, *Unearthed by workmen.* The calvaria is that of a middle-aged male. The frontal breadth is very narrow, and the maximum breadth occurs at the level of the parietal tuberosities. The skull is high, short, and of rather small breadth. It is subbrachycephalic (78.09), and appears to be the result of the admixture of a dolichocephalic element with a brachycephalic element.

The frontal region is of medium height, but narrow and very receding. In the sagittal region there is a slight median elevation and a slight postcoronoid depression. The temporal region is protuberant, with a slight supramastoid crest. The occiput shows a moderate convexity.

The sutures are simple in serration. The sagittal suture is about one-half obliterated, and occlusion has begun in the coronal. The lambdoid suture is open. There is an apex bone in this suture and a small Wormian bone in the right squamous suture. The pterions are of the usual H-form. One small parietal foramen occurs on the right side, and two medium retromastoid foramina on the left side. The mastoids are of medium size. The brow-ridges are moderately

developed and confined to the medial portions of the orbits. The facial portion is missing.

The glenoid fossae are of medium depth and there are no postglenoid processes. The base of the skull shows no unusual features. There is a medium sized dehiscence in the floor of the left auditory meatus. The mandible is of medium development and size, except that the mylo-hyoid ridges and genial tubercles are poorly marked.

45651, *Unearthed by workmen*. This is the partially mummified skull of a young adult male subject. The scalp, hair, and integument are preserved on the right half of the cranium. This condition is probably due to the fact that the skull was covered with a brass vessel, for the mummified tissues and the adjacent bony parts show green copper stains. The skull is subbrachycephalic (79.35), hypsiccephalic (81.52), and akrocephalic (102.74).

The frontal region of the skull is medium in height, breadth, and slope. The sagittal region shows a slight median elevation. The temporal regions are rather flat. The occipital region is steep, with traces of a torus. The sutures are simple, and obliteration has begun dorsally in the pterion regions. The half of the skull uncovered shows no Wormian bones. The left side shows one large, one medium, and one small retromastoid foramen, and the mastoid process is of medium size.

The brow-ridges are limited to the median halves of the supraorbital region and show average development. The nasion depression is slight. The nasal bridge is low, of medium breadth, and concavo-convex in profile. The nasal aperture is broad, with indistinct lower borders and a small spine. There are traces of subnasal grooves. The orbits are oblong, with no inclination of their horizontal axes. On the left side an infraorbital suture is about one-half complete. The suborbital fossae are medium; the malars and zygomata are large. Alveolar prognathism is very slight.

The dentition is complete, and the wear of the teeth is slight. The teeth are of good quality. The cusps of the upper molars show a 4-3-3 formula, and the lower molars 5-4-?. The third molars are much reduced in size. Traces of shovel incisors may be observed. Observations and measurements on the palate and teeth are incomplete, because the mandible cannot be disarticulated without destroying the mummified tissues. The palate is parabolic, with a slight torus. The glenoid fossae are deep, with marked postglenoid

processes. The styloids are rudimentary. The other features of the skull base, so far as observable, are ordinary. Incomplete pterygospinous foramina are present.

The mandible is large, with a prominent chin, and a medium development of other morphological features.

The hair preserved is straight and black, but rather fine in quality. The interior of the skull still contains the dried mass of the brain tissues.

60377, *Unearthed by workmen*. Fragmentary calvaria of a middle-aged male. The length-breadth index is subdolichocephalic (75.81). The frontal region is of medium breadth, but low and retreating. The sagittal region has a slight median elevation. The temporal region is moderately convex, as is also the occipital region. The sutures are simple in serration. The sagittal suture is half obliterated, and, in the coronal, obliteration has begun in the lateral portions. The lambdoid suture also shows beginnings of external obliteration. There are no Wormian bones. Two very small parietal foramina are found on the right side, and there are one small right and two small left retromastoid foramina. The mastoids are of medium size, but the brow-ridges are small and divided into medial and lateral portions. The facial portion is fragmentary. The nasal aperture is broad. It has no lower borders; the nasal floor slopes off into an alveolar clivus without definite transition. The nasal spine is rudimentary. The orbits are oblong, low, and horizontal. There are no infraorbital sutures. The suborbital fossae are shallow. There is a moderate degree of alveolar prognathism.

The dentition is complete and the crowns of the teeth are markedly worn. Three molars have been lost in life, and there are traces of five alveolar abscesses, but the general quality of the teeth is good. The cusps cannot be counted. Evidently the third molars are much reduced in size. The palate is of the usual parabolic shape. The base of the skull shows a medium development in all features.

The mandible is large and heavy, with thick everted gonial angles and extensive attachments of masticatory muscles. The mental prominence is submedium in development. Other features are ordinary.

60383, *Grave 4, Eastern skeleton.* Skeleton of a middle-aged male. The skull is fragmentary, but seems to have been about 192 mm. long and approximately 140 mm. broad. It was, then, pronouncedly dolichocephalic. The frontal region of the calvaria is

MEASUREMENTS OF CRANIA

Catalogue number	60380	60388	60379	45651	60377	60384	56669	60378
Sex	Male	Male	Male	Male	Male	Female	Female	Female
Age	y. ad.	mid.	mid.	y. ad.	mid.	sub.ad.	y. ad.	mid.
Deformation
Glabello-Occipital length ..	192	187	178	184	(186)	167	169	178
Maximum breadth	137	135	139	146	141	133	133	140
Basion-Bregma height ..	144	140	138	(150)	?	142	137	136
Min. Frontal diameter ..	98	102	89	(98)	98	85	91	92
Total Facial height	126	132	?	(117)	?	110	?	?
Upper Facial height	79	(76)	?	70	?	68	71	?
Bizygomatic diameter	147	(148)	?	140	?	(124)	?	?
Bigonial diameter	110	106	?	107	107	97	?	?
Height of Symphysis	38	39	?	35	35	33	?	?
Bicondylar width	(138)	?	?	?	?	113	?	?
Min. breadth of Ascending Ramus	40	40	37	43	41	37	?	?
Height Ascending Ramus ..	70	64	58	?	61	50	?	?
Condylc-Symphyseal length	109	119	?	?	115	100	?	?
Height of Orbits: right ...	35.5	36	?	?	?	31	?	?
left ...	35.5	36	?	29	?	31	36	?
Breadth of Orbits: right ...	45	46	?	?	?	38	?	?
left ...	45	46	?	39	?	36.5	38	?
Nasal height	58	52	?	51	?	51	50	?
Nasal breadth	26	27	?	27	27.5	24	25	?
Basion-Alveon	104	(104)	?	(103)	?	98	101	?
Basion-Nasion	111	114	?	107	?	103	102	?
Palate: External length ..	58	61	?	(57)	58	53	53	?
External breadth ..	70	72	?	?	68	64	59	?
Maximum circumference ..	520	521	496	(520)	(515)	476	485	505
(above brow-ridges)								
Arc: Nasion-Opisthion ...	375	373	365	(382)	?	351	345	370
Arc: Transverse	303	303	314	(327)	(320)	301	298	312
Foramen magnum: length	40	32	35	35	?	33	39	35
breadth	37	32	29	33	?	30	32	35
Thickness of Left Parietal (above squamous suture)	5.3	3	7	(4.6)	(4.6)	3	3.6	5.3
Capacity	1480	1530	?	?	?	1310	1280	1410

rather low, but of medium breadth and slope. The sagittal region has a slight median elevation. The temporal regions are flat, and the occipital region is protuberant, with a well-marked inion. The sutures are simple in serration. The sagittal suture shows obliteration beginning dorsally, and the lambdoid suture shows considera-

ble ventral occlusion. There are a few small Wormian bones in the lambdoid suture. There are no parietal foramina, and the mastoid processes are rather small. The brow-ridges are of medium size and divided into median and lateral portions. The facial portion is detached and fragmentary. On the right side is a complete infraorbital suture. The malars are large, but the zygomata show only medium development. The dentition is complete and moderately worn. The teeth are of fair quality, showing a few caries and traces of several alveolar abscesses. The cusp formula of the lower molars is 5-5-4. The mandible is large, with a prominent mental process,

CRANIAL INDICES

Catalogue number	60380	60388	60379	45651	60377	60384	56669	60378
Sex	Male	Male	Male	Male	Male	Female	Female	Female
Length-Breadth	71.35	72.19	78.09	79.35	(75.81)	79.64	78.70	78.65
Height-Length	75.00	74.87	77.53	81.52	?	85.03	81.07	76.40
Height-Breadth	105.11	103.70	99.28	102.74	?	106.76	103.01	97.14
Cranial Module	157.6	154.00	151.6	160.0	?	147.3	146.3	151.3
Total Facial	85.71	89.19	?	83.57	?	88.71	?	?
Upper Facial	53.74	51.35	?	50.00	?	54.84	?	?
Gnathic	93.69	91.23	?	96.26	?	95.15	99.02	?
Orbital: right	78.89	78.26	?	?	?	81.58	?	?
left	78.89	78.26	?	74.36	?	84.93	97.74	?
Nasal Index	44.83	51.92	?	52.94	?	47.06	50.00	?
Palato-Maxillary	120.69	118.03	?	?	117.24	120.75	111.32	?

a well-marked mylo-hyoid ridge, but small genial tubercles. The ganial angles are everted.

60387, Grave 5. These are fragments of the skull of a middle-aged male. The teeth are well worn. The palate shows a well-developed torus. The fragmentary mandible was large, with prominent mental process and strongly everted gonial angles. The mylo-hyoid ridge and genial tubercles are poorly developed. The fragments show strong muscular attachments. No measurements could be taken, nor were sufficient portions preserved to permit repair of the skull.

60384, Grave 4, Western skeleton. Skeleton of a sub-adult female about eighteen years of age.

The skull is in a good state of preservation. The frontal region is narrow and of medium height and slope. There is a slight median frontal crest. The sagittal region is moderately arched, with a

slight postcoronoid depression. The skull is rather narrow. It is subbrachycephalic (69.64), hypsicephalic (85.03), and akrocephalic (106.76). The temporal region is rather flat, and the occipital curve is steep. The sutures are of a simple pattern and have remained open. There are no Wormian bones. The pterions are a narrow H in shape, and there is but one small left parietal foramen. One medium retromastoid foramen is found on each side, and the mastoid processes are small.

The brow-ridges are undeveloped, and there is no nasion depression. The nasal bridge is low, of medium breadth, and concavo-convex. The nasal aperture is of medium breadth, with dull lower borders and a small spine. The orbits are oblong and horizontal, and there are no infraorbital sutures. Suborbital fossae are shallow, malars of medium size, and zygomata small. There is a moderate alveolar prognathism. The dentition is complete, the teeth of excellent quality and but slightly worn. The molar cusp formula is $\begin{smallmatrix} 4-4-3 \\ 5-5-4 \end{smallmatrix}$. Shovel-shaped incisors are present. There is but one caries, and one alveolar abscess. On account of reduction and rotation of the third molars, the palate is elliptical in shape, with a slight torus. The glenoid fossae are of medium depth, with traces of the postglenoid tubercle. The styloids are undeveloped. The middle lacerate foramina are small, but the petrous parts show a moderate depression. The posterior lacerate foramina are large. There are no other features of the skull base of particular note, except that postcondyloid foramina are absent and there are no dehiscences in the floor of the auditory meatus. The mandible is of medium size, but with a rather low and broad ascending ramus and a shallow sigmoid notch.

60381, *Grave 2*. Fragmentary skull of a young adult female. Although measurements cannot be taken, the subject was certainly dolichocephalic. The frontal region shows medium height, breadth, and slope. The calvaria is narrow in the sagittal region and shows a slight postcoronoid depression. The temporal regions are flat and the occiput is protuberant. The sutures are simple in pattern and obliteration has not begun. There are no Wormian bones, no parietal or retromastoid foramina. The pterions are of the usual H-form. The mastoid processes are small. There is a medium development of the supraorbital ridges, which are divided into median and lateral portions. No depression occurs at nasion. The nasal bridge is

broken away. The nasal aperture is of medium breadth, with sharp lower borders and a medium-sized spine. Traces of subnasal grooves were noticed. The orbits approximate to a square form and show slight inclination of their horizontal axes. Malars and zygomata are broken. There seems to have been a moderate degree of alveolar protrusion.

The dentition is complete, and the teeth are but slightly worn. The quality is fair. The dental cusp formula for molars is $\frac{4-4-4}{5-5-5}$. There are no shovel-shaped incisors. Four alveolar abscesses have left their traces in the dental arch. The palate is parabolic, with a high roof. The glenoid fossae are of medium depth and have no postglenoid processes. Styloids are undeveloped. The skull base is fragmentary, and the vault has suffered considerable post-mortem deformation. The mandible is of medium size and shows poor development of the mylo-hyoid ridge and the genial tubercles.

56669, Unearthed by workmen. This is the calvarium of a young adult female. Its description is very similar to that of No. 60384. It is also subbrachycephalic (78.70), hypsiccephalic (81.07), and akrocephalic (103.01). In features of the skull vault it is almost identical with the previously described female skull. The orbits, however, are high and rounded; the suborbital fossae are pronounced and there is marked alveolar prognathism. Most of the teeth have dropped out, but it is evident that the dentition was complete and that the third molars were much reduced. Traces of one alveolar abscess were noted. The palate is parabolic. The base of the skull presents the usual low relief found in the crania of female Indians. There is no accompanying mandible.

60378, Unearthed by workmen. Skeleton of a middle-aged female. The facial portion of the skull is broken away and the mandible is fragmentary. The calvaria is subbrachycephalic (78.65), hypsiccephalic (76.40), and metriocephalic (97.14). It is of good size and capacity (1410 cc.). The morphological features are those of an average Indian female, with points of sex distinction well marked.

60385, Grave 4. These are the bones of the "child nearest the mother." Since the milk dentition is complete the child must have been twenty months to three years of age.

60386, Grave 4. These are the bones of the "infant by the side of the other child." In this case also the milk dentition is complete.

The child was then within the limits of age stated in the case of the preceding subject.

60383, *Grave 3*. Bones of an infant. The first milk molar is erupted but the second is unerupted. The age of the infant was then twelve to twenty-one months.

60382, *Grave 10*. Bones of a child. The first lower milk molar has erupted, the lower canine is almost erupted, and the second milk molar is unerupted. The age of the child at death was probably between sixteen and twenty-four months. The orbits of this child show somewhat dubious traces of symmetrical osteoporosis. This is a nutritional disease of obscure nature, especially common in crania of Peruvian and Central American Indians. The writer has seen it in ancient Indian crania from the Southwest; but has never before observed it in crania of Eastern Indians.

60389, *Grave 9*. Skeleton of a child. The milk dentition is complete and shows a certain amount of wear. The child was aged three to five years. Here again the left orbit shows signs of an osteoporitic condition.

LONG BONES

The femora of this series display ordinary Indian characteristics and do not merit individual descriptions. The middle shaft section is usually prismatic, the *linea aspera* is well developed, and there is a marked pilaster. Curvature is medium. Some form of a third trochanter is generally present. *Platymeria* is pronounced. Torsion of the femoral head is medium to pronounced.

The tibiae have strongly retroverted heads. The external tibial condyle is usually more or less convex. *Platynemia* is marked. The shaft form is usually a lateral prism. "Squatting facets" on the anterior lip of the inferior articular surface are usual.

The other long bones present no features of special interest.

The long bones of three male skeletons and three female skeletons were sufficiently preserved to permit their utilization for the calculation of stature. For this purpose the well-known formulae of Pearson have been utilized.¹

The tibio-femoral index in this group, as in many other Indian groups, is extremely high. Stature calculated on the tibiae, conse-

¹ Pearson, Karl, On the Reconstruction of the Stature of Prehistoric Races, *Philosophical Trans.* 192, A, 1899, p. 196.

MEASUREMENTS AND INDICES OF LONG BONES

	60380 Male		60388 Male		60377 Male		60384 Female		60378 Female		60381 Female	
	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left
<i>Femur</i>												
Bicondylar length	460	465	481	485	433	433	?	432	?	(435)	?	426
Maximum length	463	469	485	489	438	436	?	436	(446)	?	431	431
Maximum diameter of Head	46	47	48	48	46	46	42	?	42	43	40	40
Subtrochanteric diameter												
Antero-Posterior	25	26	26	26	25	26	20	?	23	23	19.5	20
Lateral	39	38	40	39.5	34	34	30	?	35	36	31	30
Middle Shaft diameter												
Antero-Posterior	30.5	33	32	33.5	32.5	32	25	?	30	29	26	26
Lateral	28	28	28	30	28	29	22	?	26	26	24	23.5
Middle Index	91.80	84.85	87.50	89.55	86.15	90.63	88.—	?	86.67	89.66	92.31	90.38
Index of Platymeria	64.10	68.42	65.—	65.82	73.53	81.25	66.67	?	65.71	63.89	62.90	66.67
<i>Tibia</i>												
Length minus spine	?	401	406	402	?	?	356	353	383	?	356	356
Middle diameter												
Antero-Posterior	?	30.5	34	36	?	35	26	25	31	?	25.5	26.5
Lateral	?	22	22	22.5	?	22	17	17	21	?	18	18
Middle Index	?	72.13	64.71	62.50	?	62.86	65.38	68.—	67.74	?	70.58	67.92
Diameter at level of nutrient foramen												
Antero-Posterior	?	41	39	41	41	38	32	39	34	?	27	28.5
Lateral	?	23	23	23	26	23	20	18	22	?	20	19
Index of Platymenia	?	57.50	58.97	56.10	63.41	60.53	62.50	64.29	64.71	?	74.07	66.67
<i>Humerus</i>												
Maximum length	?	?	345	342	?	314	306	304	323	?	311	310
Middle diameter	?	?	?	?	?	?	15	15	23	?	21	20
Antero-Posterior	?	?	27	27	?	25	21	21	16	?	15	14
Lateral	?	?	27	27	?	?	?	?	?	?	243	238
<i>Radius</i>												
Maximum length	?	?	272	?	244	248	?	?	?	?	262	?
<i>Ulna</i>												
Maximum length	?	?	(293)	293	?	?	?	?	?	?	?	?
Humero-Femoral Index	?	?	71.13	69.93	?	72.01	?	69.72	74.25	?	?	72.76
Tibio-Femoral Index	?	86.23	83.71	82.22	?	?	?	80.59	?	?	?	82.59

quently, is somewhat higher than when calculated from the lengths of other long bones. In the present instance, formulae utilizing the lengths of both femur and tibia have been utilized, or, when necessary, the mean stature has been deduced from the results arrived at by using formulae for separate bones.

No. 60380, an extremely dolichocephalic male, must have had a stature in life of about 171.5 cm. On the basis of femora the stature of this subject is 168.5, but the tibia yields a stature of 174.4 cm.

No. 60388, another dolichocephalic male, was about 174.3 cm. tall. Here again the tibia yields too high a stature (175.1 cm.). No. 60377, a mesocephalic male, had a much lower stature, only 163.6 cm., reckoned on the basis of the femur. The tibiae are missing. If these had been present the estimate of stature would have been raised to about 165 cm.

No. 60384, a sub-adult female, had a stature of about 157.5 cm. No. 60378, a rather large female, had a stature of about 161.8 cm. No. 60381, a young adult female, was about 158 cm. in stature.

Pelvis. The pelvises show the usual marks of sex differentiation. With the exception of that of No. 60378, they were too fragmentary for the taking of measurements.

MEASUREMENTS AND INDICES OF PELVIS OF No. 60378, FEMALE

	mm.		mm.
Pelvis as a whole		Ossa Innominata	
Breadth Maximum ...	257	Height	
Superior Strait		right	200
Breadth Maximum .	124	left	201
Sagittal diameter ...	115	Breadth	
Distance between		right	148
Ischiatic Spines	(95)	left	?
Height of Sacrum	106	Sacral Index	116.03
Breadth of Sacrum	123	Index of Right	
Pelvic Index	78.—	Innominate Bone	74.—
Brim Index	92.74		

The brim index of this pelvis is so high that one might judge it to be that of a male, were it not for the morphological features, which are clearly female. The ischiatic notch is broad; the preauricular sulcus is well marked; the subpubic angle is large; and the ascending ramus of the ischium and the symphysis pubis are characteris-

tically female. The condition of the pubic symphysis indicates the ninth phase of Todd's age gradations.

Vertebrae. In general the vertebrae of these skeletons present no features of special interest. Marginal exostoses occur on the vertebrae of No. 60377, a middle-aged male. In the case of 60383, another middle-aged male, the vertebrae seem to be carious. One suspects tuberculosis, but it is scarcely safe to attempt a definite diagnosis.

SUMMARY

In addition to the usual tall dolichocephalic type of Eastern Indian there is present in this series a mesocephalic type due to admixture of a short brachycephalic stock. The evidence of this admixture is to be seen in the shortening of the skull, the increase of breadth across the posterior portions of the parietals, increase of the skull height, shorter face, and broader, lower nose. The measurements of some of the mesocephals and subbrachycephals are such as to make one suspect some occipital deformation. This, however, is not apparent from the contours of the occipital bones. In the short series from Winthrop this mixed type actually predominates.

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